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TO: Office of Drinking Water Field Office Staff

THROUGH: G. W. Peaks, P.E., Director
Office of Drinking Water

FROM: Radionuclides Rule Team

SUBJECT: Enforcement and Public Notification– Radionuclides Monitoring/Scheduling and
CCR Reporting

Delete Working Memo 857

The radionuclides regulation effective on December 8, 2003 requires routine monitoring of gross alpha activity, radium₂₂₆, radium₂₂₈ and uranium at each entry point to the distribution system for community waterworks. The initial sampling requirement, unless the entry point is grandfathered, is quarterly for four quarters. The next sampling period is determined based on the initial or most recent compliance period results and could be a quarterly, 3-year, 6-year, or 9-year frequency. The required sample periods and cycles fit into a standardized monitoring framework of three 3-year periods comprising a 9-year compliance cycle. The three 3-year sampling periods following the initial sampling period of 2004–2007 are 2008–2010, 2011–2013, and 2014–2016 comprising a 9-year cycle of 2008–2016.

Monitoring Substitutions and Calculated Values

The rule allows substitution of gross alpha activity for radium₂₂₆ when the gross alpha activity is less than 5 pCi/L and substitution of gross alpha activity for uranium when the gross alpha activity is less than 15 pCi/L. Since the combined radium PMCL is based on the sum of radium₂₂₆ + radium₂₂₈, DCLS has agreed to analyze for radium₂₂₆ when gross alpha activity is more than 3 pCi/L to minimize potential radium violation issues from gross alpha substitution. When a sample result exceeds the PMCL, both radium₂₂₆ and radium₂₂₈ analyses should be specifically required for the follow-up quarterly sampling.

Also, the DCLS routine procedure is to measure uranium activity when uranium measurement is required. The uranium PMCL is based on mass rather than activity; however, uranium mass may be calculated from activity using a factor of 0.67pCi/ug (e.g. 20 pCi/L = 30 ug/L). Uranium mass should be analyzed when the value from the uranium activity calculation indicates a uranium exceedance (i.e. >30 ug/L) since the calculated value may be conservative and the actual mass value may be less.

Monitoring Groups

For simplicity, the intent of ODW is to maintain routine monitoring requirements for radionuclides as a group rather than individual analytes. Also, DCLS routinely analyzes radionuclide samples for gross alpha activity and radium₂₂₈ with values for radium₂₂₆ and uranium subsequently obtained by substitution and calculation by ODW. Of course, DCLS will perform the additional analyses required when the gross alpha triggers are exceeded. The exception to monitoring radionuclides as a group is when an MCL value is exceeded and quarterly monitoring is required. In this case, quarterly monitoring is only required for those radionuclides which exceeded the MCL. For practical purposes, these will be two subgroups, one being gross alpha and uranium and the second being radium₂₂₆ and radium₂₂₈.

Scheduling

For community waterworks, the radionuclides regulation requires initial quarterly sampling for four quarters for each entry point into the distribution system. Frequency for the next sampling event depends on the results for the current period. If the monitoring result is below detection limit for each contaminant, the next sampling frequency is 9 years. However, due to the routine testing arrangement in which gross

alpha is substituted for radium₂₂₆ and the detection limit for gross alpha is greater than the detection limit for radium₂₂₆, a below-detection limit determination for radium₂₂₆ cannot be made. In this case, the next sampling event frequency is 6 years. When the monitoring result is at or above detection limit but less than or equal to ½ the MCL, the next sampling event frequency is 6 years. When the monitoring result is

greater than ½ the MCL but less than or equal to the MCL, the next sampling event frequency is 3 years. When the monitoring results exceed the MCL, quarterly sampling must continue until the results are at or below the MCL. A summary of the sampling frequencies is shown in the table below.

Next Radionuclides Monitoring Frequency Based on Current Period Result(s)

Sample Result(s)	Monitoring Frequency
Below Detection Limit	9 years
Above Detection Limit but $\leq \frac{1}{2}$ MCL	6 years
$> \frac{1}{2}$ MCL but \leq MCL	3 years
$>$ MCL	Quarterly (4 Consecutive Quarters Minimum)

Except where quarterly sampling is required, the monitoring frequency for the radionuclides group will be governed by the highest frequency requirement of the component radionuclides. Also, when establishing the actual radionuclides sampling schedule, an effort should be made to integrate the radionuclides schedule to match the Phase II/V sampling schedule for the waterworks. Also, to the extent practical, the radionuclides schedules for each ODW field office should be evenly spread over time to even workload at the DCLS radiochemistry lab.

CCR Reporting

The CCR Rule requires reporting of detections of all regulated contaminants including gross alpha and combined radium. There are no individual MCLs for radium₂₂₆ or radium₂₂₈; however, since radium₂₂₈ is part of combined radium, anytime radium₂₂₈ is detected, combined radium must be reported even if radium₂₂₆ is not analyzed or not detected. To avoid confusion with application of the CCR Rule, we will require only contaminants measured and reported by the laboratory to be included. In the case where radium₂₂₈ is analyzed but radium₂₂₆ is not, combined radium is reported as the radium₂₂₈ value. Likewise, in cases where radium₂₂₆ is detected and reported, but radium₂₂₈ is absent or below detection levels, the radium₂₂₆ result should be reported in the CCR as combined radium. Keep in mind that whenever a potential violation exists additional analyses will be required by ODW for compliance determination and reporting.